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ABSTRACT

Coping skills and work motivation were investigated as predictors of academic achievement in Japan, West Germany, and Austin, Texas. Data were gathered from a sample of 3,600 ten and fourteen-year olds. Aptitude was measured by the Raven Progressive Matrices; achievement was measured by standardized tests in reading and mathematics, and by grade point average (GPA). A number of instruments were developed to assess coping skills and work motivation. Three general conclusions were made. (1) The amount of total variance explained was substantial, except for the case of GPA in the German high schools. (2) The coping/motivation measures accounted for more of the variance in achievement than did aptitude, at age 14, in all cases except math and GPA in Germany. Even at age ten, these measures accounted for the largest portion of the explained variance in reading in all countries. (3) There are major differences in the factors that account for achievement in these three countries; and there are age differences that also vary from one country to another. The coping and motivational factors which had the most power in predicting reading achievement and GPA in 14-year olds in each country are listed. (Author/GDC)

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COPING STYLES THAT PREDICT ACHIEVEMENT IN GERMANY, JAPAN, AND AMERICA

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COPING STYLES THAT PREDICT ACHIEVEMENT IN GERMANY, JAPAN, AND AMERICA

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Measures of coping skills and work motives were applied in eight countries, to 10 and 14 year old youth. The measures predicted standardized achievement scores and GPA to a substantial degree, beyond the predictive power they shared with aptitude. Achievement was explained by a different pattern of coping skills and work motives in each country. Data from Germany, Japan, and America illustrate these patterns.

Coping Styles That Predict Achievement in Germany, Japan, and America

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The Cross-National Study of Coping Styles and Achievement was carried out in eight countries. Its aims were to (1) develop a reliable, internationally usable conceptual system to describe coping behavior; (2) develop internationally uniform instruments for assessing coping skills and work motivation; (3) discover what skills and motives were most conducive to achievement in each country; and (4) determine the most useful instrument-set (both predictive and economical) for explaining and predicting achievement in each country. The present report illustrates how these aims were fulfilled, using data from three countries.

Design

An initial conceptual design and instrumentation was developed by the present first author, and a grant was secured. Thereafter, all decisions were reached by the collegial team of researchers, in semi-annual conferences. Each test item was developed in conference, in English, translated, independently re-translated into English again, and pilot tested until only universally usable, semantically equivalent items remained. The first full-scale data were collected on 8,000 children of both sexes, 10 and 14 years, either upper-lower or upper-middle SES. A conceptual system to describe coping was developed and tried out with this sample. After revision of scoring methods and instruments, a new, similarly stratified sample of 3,600 children was studied. This last sample provides the data for this report.

Data

Aptitude was assessed by the Raven Progressive Matrices. Since it was agreed to study the predictors of achievement in each country, separately,

nationally suitable standardized tests in Reading and Math were used. Grade Point Average provided a third achievement criterion.

The instruments developed especially for the study included a Sentence Completion; Occupational Values, an inventory developed by Peck in 1965 from Super's work; Social Attitudes Inventory (SAI), a self-evaluation of coping skill; Views of Life (VOL), a questionnaire composed half of items representing Diaz-Guerrero's theory of active/passive coping styles, and half of items Peck constructed to represent the dimensions of coping behavior evolved from the early sample including two locus-of-control scales; and measures of educational and occupational aspiration level. (In Germany, the Social Attitudes and Views of Life were not used.)

Analysis

The more than one hundred variables had to be reduced to manageable, communicable proportions. Initial factor analyses of several instruments showed that each country (indeed, each age group) would have to have its own factor structure worked out, for each instrument. The children from different groups understood any one item the same way but they often clustered items quite differently. This ruled out the use of "universal" factor scores across age and country, but it has the virtue of defining clearly the precise mental constructs each different group used as it reacted to the pool of items in an instrument (Peck, 1975). Thus, in the Findings below, the composition of each factor description can be seen to differ across the countries. Thereafter, the combination of factors that predicts achievement within each country also differs. Both kinds of information, taken together, show how different patterns of coping and motivation explain achievement in the different countries.

A principle-component factor analysis was applied to each instrument, in each country/age sample with unities or communalities in the correlation matrix

as appropriate for each instrument. This was followed by an orthogonal rotation using the quartimax method. A unit weighted score for each factor was derived by standardizing the variables and selecting those variables which loaded significantly on a particular factor. The samples were also randomly halved, in the three countries, and independently factored, to check the reliability of the whole group solutions.

In each country/age group, a series of regression analyses was then done. First, the "useful" coping factors (Sentence Completion, Views of Life, Social Attitudes Inventory) were selected by a stepwise regression using Reading, Math, and GPA as criterion variables. Only those factors that significantly predicted at least one criterion were thereafter retained. As with the factor analysis, several country/age samples were randomly halved, the regression analyses independently performed on each half, and the results compared with the whole-sample solution. So far, the whole-sample solutions appear to be quite reliable in all but one sample which lacked two coping instruments. A hierarchical regression was then done for each criterion, entering the predictors in this order: Raven, Coping measures, Occupational Values factors, and the education and occupational aspiration scores. A second such analysis inserted Raven after all the coping and motivation measures, to estimate the common and unique contributions to achievement of the cognitive and non-cognitive predictors.

Findings and Discussion

The German, Japanese, and Austin 14-year-old findings will be described and compared. Table 1 shows the amount of variance in each kind of achievement explained by aptitude and by the collective coping and motivation measures. Three general findings stand out:

TABLE 1

Aptitude, Coping Styles and Work Motivation as Predictors of School Achievement

Age 14

Predictors	West Germany[2] % of variance explained[3] Reading	Math	GPA	Japan % of variance explained Reading	Math	GPA	Austin, Texas % of variance explained Reading	Math	GPA
Raven (unique)	5.0	11.0	3.0	11.0	1.0	8.5	6.0	8.5	2.0
Coping/Motives[1] (unique)	17.0	6.5	2.0	19.0	16.0	22.0	16.5	14.0	24.0
Common Variance	31.0	4.5	1.0	9.0	9.0	10.5	13.0	15.5	12.0
Total Variance Explained	53.0	22.0	6.0	39.0	44.0	41.0	34.5	38.0	38.0

Age 10

Raven (unique)	5.0	15.5	1..5	10.0	13.0	9.0	15.5	13.5	11.0
Coping/Motives (unique)	13.0	8.0	3.0	14.0	11.0	11.0	15.0	3.5	8.0
Common Variance	6.0	11.5	3.5	9.0	8.0	8.0	7.5	3.0	4.5
Total Variance Explained	24.0	35.0	18.0	33.0	32.0	28.0	38.0	20.0	24.5

[1] Coping measures: Sentence Completion, Views of Life, Social Attitudes
Motivation measures: Occupational Values, educational and occupational aspiration level.

[2] In Germany, only the Sentence Completion and aspiration measures were collected, not the Views of Life or Social Attitudes Inventory.

[3] Percent of variance explained is the change in multiple R^2.

1) The amount of total variance explained is very substantial, except for the curious case of GPA in the German high schools. The teachers' grades there were almost unrelated to either aptitude or coping skill; moreover, GPA correlated only .20 with Reading and .28 with Math Achievement. (Of course, two predictor instruments, VOL and SAI, were not given there.)

2) The coping/motivation measures, with aptitude partialled out, accounted for more of the variance in achievement than did aptitude, at age 14, in all cases except Math and GPA in Germany. This is pleasantly surprising, considering the usual limited reliability and validity of self-report measures such as these. Even at age ten, they accounted for the largest portion of the explained variance in Reading, in all three countries; a substantial portion of GPA in Japan and Austin (not Germany); and a substantial portion of Math in Germany and Japan.

3) Even these summary figures indicate major differences in the factors that account for achievement in these three countries; and there are age differences that also vary from one country to another.

To see the nature of those differences, the specific predictive factors in each sample can be inspected. It is necessary to note that the item-content of factors from any one instrument may differ by age and by country; and that a factor that predicts achievement in one group may not predict that kind of achievement, at all, in another group. The coping and motivational factors that had the most certain, individual predictive power in each group were as follows.

<u>West Germany, 14: Reading: The predictive coping and motivation factors</u>

- GF 3: Sentence Completion: Anxiety items: (does <u>not</u>) engage, use advice, or react neutrally.

  GF 6: Sentence Completion: Anxiety items: Confronts, copes, <u>without</u> depression, even with positive feelings.

  GF 10: Sentence Completion: Interpersonal items: depressive feelings;

aggression items: depressive feelings; anxiety items: (lacks) hostile affect.

GF 15: Occupational Values: Values independence.

The good German readers are particularly alert to anxiety and cope with it sturdily, even with a show of good feeling. When interpersonal or aggressive problems arise, they grow unhappy, but depressively rather than in a hostile way. They do not stand out for their coping ability, though they strongly value personal independence. They want to go through college.

West Germany, 14: GPA

Teacher grades are so unrelated to anything that not much can be said. What little predictive power there is comes from:

GF 4: Sentence Completion: Authority items: Engages, takes advice, copes well, neutrally, without hostility.

GF 15: Occupational Values: Values independence.

Students who get high grades are those who cope effectively with authority. They cooperate with people in authority, while hoping to achieve personal independence. They seek only an average level of education.

Japan, 14: Reading

JF 19: Social Attitudes: Copes effectively, in all areas.

*{ JF 17: VOL: Self-initiating
{
{ JF 25: Occ. Val.: (devalues) pleasant associates, (values) creativity

{ JF 20: Occ. Val.: Values self-satisfaction, intellectual stimulation,
{ not managerial power, success, prestige or money
{
{ JF 22: Occ. Val.: Values independence and managerial power, not pleasant surroundings.

The Japanese, good readers, at 14, are non-materialistic, intellectual and creative in their interests; self-starting, independent copers, who put

*Brackets indicate that the variables taken together predict a significant amount of variance, but either by itself would have a small amount of predictive power.

little stock in being placid "company men or women." They want to be free to be themselves. They aspire to a high level of education.

Japan, 14: GPA

JF 2: Sentence Completion: Task Achievement items: Confronts tasks, engages, takes help, copes well, (lacks) depressive affect, reacts neutrally.

-JF 6: Sentence Completion: (lacks) hostility in interpersonal encounters; reacts depressively to them, and to anxiety-arousing experiences.

JF 13: VOL: Intrinsically motivated to work; independent

JF 22: Occupational Values: Values independence, managerial power, not pleasant surroundings.

JF 20: Occupational Values: Values self-satisfaction; intellectual stimulation, not managerial power, success, prestige or money.

Japanese high school teachers give the highest grades to students who are avowedly work-oriented, for intrinsic reasons of personal motivation and intellectual hunger. These students are strongly self-controlled, turning any aggressive impulses inward, not outward. Such students do not care about the trappings of managerial power but they would like the greater independence it can bring. They want to go as far as possible in school.

Austin 14: Reading

A 20: VOL: Internal locus of control; emotionally expressive

A 17: VOL: Sees life as complex, not simple or easy

A 25: Social Attitude Inventory: Copes effectively with tasks, authority, aggressive, interpersonal relations, but not with anxious feelings.

*{ -A 7: Sentence Completion: Aggression items: (does not) confront, engage in problem solving effort, or use help, in dealing with aggressive impulses from within.

{ A 4: Sentence Completion: Aggression items: Engages, takes help, copes well with aggressive impulses in an emotionally neutral, non-hostile way.

The apparent contradiction between A 7 and A 4 is due to the element of direct, open confrontation with the problem of aggressive impulse. This is

*See page 6

absent in A 4, but present in A 7 and probably accounts for its negative correlation with achievement. Clearly, the important thing is that good readers in Austin are non-belligerent. Control of their own aggressive impulses is both a central issue in their lives, and one they handle in a civilized way. They like to express other kinds of feelings openly, seeing this as an essential part of "being themselves." They believe they cope well, except that they aren't so sure they handle anxious feelings effectively.

Aspiration for advanced education is a moderately strong element in their effort.

Austin, 14: GPA

A 20: VOL: Internal locus of control; emotionally expressive

A 25: Social Attitudes Inventory: Copes effectively, except for anxiety

A 17: VOL: Sees life as complex, not simple or easy

A 6: Sentence Completion: Authority items: Confronts, engages, uses help and copes well with authority.

-A 18: VOL: (does not) act immediately, and fast, when facing a problem.

*{ -A 7: Sentence Completion: Aggression items: (does not) confront, engage, seek help.

{ A 4: Sentence Completion: Aggression items: Engages, seeks help, copes well with aggressive impulses, in an emotionally neutral, non-hostile way.

*{ A 5: Sentence Completion: Interpersonal items: Emotionally neutral and non-hostile in dealing with interpersonal problems. Authority items: copes well, also in a neutral, non-hostile way.

{ A 1: Sentence Completion: Interpersonal items: Confronts, engages, uses help, copes well, in a neutral, non-hostile manner.

A 14: Occupational Values: Seeks success, not creativity or pleasant surroundings.

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*See page 6

Austin teachers, at this age level, gave highest grades to students who are self-directing and success-oriented but who act in a reflective, firmly self-controlled, cooperative and civilized manner. These students make a point of getting along with people in authority. Control of their own aggressive impulses is very important to them, and they do it effectively, they believe. They are not so confident that they can tolerate or manage anxious feelings that well. They don't expect life to be easy, but they do feel in control of their own lives and free to express their feelings and thoughts, so long as they are not belligerent about it.

Ambition for further education plays a moderate part in their efforts.

Conclusions

The aims of the study were achieved. The coping theory it generated proved measurable and valid when tested against actual achievement. Each country turns out to have its own, partially unique formula that explains what motives and coping skills produce the best achievement. Practically speaking, the non-cognitive coping motivation measures have shown more power to predict and explain school achievement than any previous measures of this kind.